

Notice of Allowability

Application No.

10/772,971

Examiner

SUZANNE LO

Applicant(s)

LU, JOSEPH Z.

Art Unit

2128

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to After Final Amendment submitted 01/23/09.
2. ☒ The allowed claim(s) is/are 2,3,5,7,9-11,13,14,17-19,21,22 and 24-32.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 01/30/08
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 02/10/09.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

DETAILED ACTION

Response to Amendment

1. Claims 2-3, 5, 7,9-11, 13-14, 17-19, 21-22, and 24-32 are allowed over the prior art of record.

The After-Final Amendment submitted on 01/23/09 has been entered.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David Doyle on 02/10/06 at 3:00PM.

The application has been amended as follows:

Claim 7: Add, -- the first and second signals associated with a control system, -- after the phrase "electronically receiving a projection associated with a first signal and a second signal,".

Claim 11: Add, -- the first and second signals associated with a control system, -- after the phrase "electronically receiving a projection associated with a first signal and a second signal,".

Add -- having two diagonals that divide the upper triangular matrix into four sections, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, -- between "matrix" and "the" in the phrase "the projection comprising a first upper triangular matrix the projection at least partially isolating".

Add --, the defined areas located in a single one of the sections of the upper triangular matrix -- between "matrix" and "," of the phrase "identifying one or more model parameters for each of multiple defined areas in the first upper triangular matrix;".

Claim 17: Add, -- associated with a control system -- after the phrase “at least one input receiving a first signal and a second signal”.

Remove “multiple” in the phrase “wherein each of the one or more second defined areas represent a matrix centered along one of multiple diagonals of the upper triangular matrix”. Add, -- the -- between “one of” and “diagonals” of the above phrase.

Claim 19: Add, -- associated with a control system -- after the phrase “at least one input receiving a first signal and a second signal”.

Add -- having two diagonals that divide the upper triangular matrix into four sections, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, -- between “matrix” and “the” in the phrase “the projection comprising a first upper triangular matrix the projection at least partially isolating”.

Add -- , the defined areas located in a single one of the sections of the upper triangular matrix -- between “matrix” and “;” of the phrase “identifying one or more model parameters for each of multiple defined areas in the first upper triangular matrix;”.

Claim 21: Remove “program” in the phrase “The computer program of Claim 24”. Add, -- readable medium -- between “computer” and “of” in the phrase “The computer of Claim 24”.

Claim 22: Remove “program” in the phrase “The computer program of Claim 24”. Add, -- readable medium -- between “computer” and “of” in the phrase “The computer of Claim 24”.

Claim 24: Remove “program embodied on a computer readable medium” between “computer” and “the computer program” of the phrase “A computer program embodied on a computer readable medium, the computer program comprising”. Add, -- readable medium embodying a computer program, -- between “computer” and “the computer program” of the above phrase.

Add, -- the first and second signals associated with a control system -- after the phrase “computer readable program code that receives a projection associated with a first signal and a second signal,”.

Claim 25: Remove “program” in the phrase “The computer program of Claim 24”. Add, -- readable medium -- between “computer” and “of” in the phrase “The computer of Claim 24”.

Claim 26: Remove “program” in the phrase “The computer program of Claim 24”. Add, -- readable medium -- between “computer” and “of” in the phrase “The computer of Claim 24”.

Claim 27: Remove “program embodied on a computer readable medium” between “computer” and “the computer program” of the phrase “A computer program embodied on a computer readable medium, the computer program comprising”. Add, -- readable medium embodying a computer program, -- between “computer” and “the computer program” of the above phrase.

Add, -- the first and second signals associated with a control system -- after the phrase “computer readable program code that receives a projection associated with a first signal and a second signal,”.

Add -- having two diagonals that divide the upper triangular matrix into four sections, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, -- between “matrix” and “the” in the phrase “the projection comprising a first upper triangular matrix the projection at least partially isolating”.

Add -- , the defined areas located in a single one of the sections of the upper triangular matrix -- between “matrix” and “;” of the phrase “computer readable program code that identifies one or more model parameters for each of multiple defined areas in the first upper triangular matrix;”.

Allowable Subject Matter

3. The following is a statement of reasons for the indication of reasons for allowance:

Applicants are disclosing a method, system, and apparatus of receiving a projection associated with a first signal and a second signal, the first and second signals associated with a control system, the second signal comprising a first portion associated with the first signal and a second portion not associated with the first signal, the projection comprising an upper triangular matrix, the projection at least partially isolating the first portion of the second signal from the second portion of the second signal; identifying model parameters using at least a portion of the projection; and generating and storing a model associated with the model parameters the model associating the first signal and the first portion of the second signal wherein identifying the model parameters comprises: identifying one or more pole candidates using one or more first defined areas in the upper triangular matrix, the model parameters comprising at least one of the one or more pole candidates. This has been disclosed in the prior art of record.

The prior art of record does not disclose the method wherein each of the one or more second defined areas represents a *backward column Hankel* matrix centered along one of multiple diagonals of the upper triangular matrix, *and wherein identifying the one or more model candidates comprises rewriting each backward column Hankel matrix as a forward column Hankel matrix.*

The prior art of record also does not disclose the method, system and apparatus wherein the projection associated with a first signal and a second signal, the projection comprising a first upper triangular matrix *having two diagonals that divide the upper triangular matrix into four sections, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix*, the projection at least partially isolating the first portion of the second signal from the second portion of the second signal, and identifying one or more model parameters for each of multiple defined areas in the first upper triangular matrix, *the defined areas located in a single one of the sections of the upper triangular matrix.*

The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

U.S. Patent Application Publication 2004/0057585 A1, published by Madieviski et al.:

Discloses receiving a projection associated with a first signal and a second signal, the second signal comprising a first portion associated with the first signal and a second portion not associated with the first signal, the projection comprising an upper triangular matrix, the projection at least partially isolating the first portion of the second signal from the second portion of the second signal ([0008]-[0012], [0050]); identifying model parameters using at least a portion of the projection; and generating and storing a model associated with the model parameters ([0042]-[0043]) the model associating the first signal and the first portion of the second signal ([0043]) wherein identifying the model parameters comprises: identifying one or more pole candidates using one or more first defined areas in the upper triangular matrix ([0044]-[0045]), the model parameters comprising at least one of the one or more pole candidates ([0046]-[0047]). However, Madieviski fails to disclose wherein each of the one or more second defined areas represents a backward column Hankel matrix centered along one of multiple diagonals of the upper triangular matrix, and wherein identifying the one or more model candidates comprises rewriting each backward column Hankel matrix as a forward column Hankel matrix, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, the defined areas located in a single one of the sections of the upper triangular matrix.

U.S. Patent Application Publication 2005/0015205 A1, published by Repucci et al.: Discloses projecting a matrix by performing canonical QR-decomposition on the matrix with an orthogonal matrix and an upper triangular matrix ([0010], [0073], page 8, [0101]) wherein each of the one or more second

defined areas represents a matrix centered along one of multiple diagonals of the upper triangular matrix ([0089]) wherein identifying model parameters comprises using one or more defined areas in the upper triangular matrix, the model parameters comprising at least one of the one or more model candidates ([0084]- [0089]). However, Repucci fails to disclose wherein each of the one or more second defined areas represents a backward column Hankel matrix centered along one of multiple diagonals of the upper triangular matrix, and wherein identifying the one or more model candidates comprises rewriting each backward column Hankel matrix as a forward column Hankel matrix, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, the defined areas located in a single one of the sections of the upper triangular matrix.

“Detection and multichannel SVD-based filtering of trigeminal somatosensory evoked potentials”, published by Swinnen et al.: Discloses generated matrix comprises a forward column Hankel matrix based on a prediction error, the prediction error associated with the one or more model parameters that are associated with that defined area (page 302, 1st column, Step 2). However, Swinnen fails to disclose wherein each of the one or more second defined areas represents a backward column Hankel matrix centered along one of multiple diagonals of the upper triangular matrix, and wherein identifying the one or more model candidates comprises rewriting each backward column Hankel matrix as a forward column Hankel matrix, a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, the defined areas located in a single one of the sections of the upper triangular matrix.

U.S. Patent Application Publication 2003/0004658, Bechhoefer et al.: Discloses using a model which has been derived from isolating one signal from multiple signals to control adjustments made to

rotating blades ([0011]). However Bechhoefer does not disclose rewriting a backward Hankel matrix as a forward column Hankel matrix a first of the diagonals starting at an upper left corner of the upper triangular matrix and traveling down and right in the upper triangular matrix, a second of the diagonals starting at a lower left corner of the upper triangular matrix and traveling up and right in the upper triangular matrix, the defined areas located in a single one of the sections of the upper triangular matrix.

These features relating to the specific sequence of method steps, system, and apparatus components as noted above renders claims 17, 19, 24, and 27 non-obvious over the prior art of record.

Process claims 2-3, 5, 7, 9-11 are proper under 35 U.S.C. 101 as a specific machine is inherent to said claims as the method steps are performed electronically.

All claims are directed to a specific practical application, signal analysis of signals associated with a control system.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne Lo whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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